



METHOD FOR THE PRODUCTION OF ELECTRIC ENERGY AND MHD GENERATOR THEREFOR

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to power engineering, namely, improvements in generation of electrical energy by magnetohydrodynamics.

Description of Related Art

There is a known method of producing energy (WO 90/00526, 1990, in particular thermal energy, by arranging the motion of water in a predetermined direction in a closed circuit. This method uses unique properties of polar working fluids stipulating a release of energy as a result of hydrogen bonds opening. Besides, a release of kinetic energy along with heat one is noted. However, this method does not allow producing electric energy as suitable for use. A similar method (RU 2124681, 1999) explains of the release of additional energy of said liquid, namely from a combination of cold nuclear fusion and cavitation processes. The additional kinetic energy caused the working fluid to move at accelerated velocity in the closed circuit. However, this method is not intended for producing electric energy.

Another previous device and method of producing electric energy (SU 753372, 1980) by utilized a method of arranging the motion of ferromagnetic spheroids in a predetermined direction in a closed channel, when voltage produced at the expense of electromagnetic induction is collected by means of electromagnetic windings. This device which implements the method contains a hermetically sealed toroidal channel in which there is a conducting medium as ferromagnetic spheroids and electromagnetic system with windings. The said device and method as has the disadvantage of a low efficiency factor, are rather complex and have low reliability.

A type of generator that create useable electrical energy from moving fluids is the magnetohydrodynamic generator (MHD generator). This method of producing electric energy (RU 2071163, 1996; RU 95110712, 1997) by utilizes arranging the motion of a conducting medium in a predetermined direction in a closed channel when the produced electric energy is collected by means of electromagnetic windings. Ionized gas is issued as a conducting medium. The device which implements the method, a type of MHD generator, contains a closed toroidal channel with a body made of non-magnetic material, inside of which there is a dielectric cover

and electromagnetic system with windings. The known method and device have a low efficiency factor, are rather complex and have low reliability. Besides, this method is not ecologically safe.

BRIEF SUMMARY OF THE INVENTION

This invention applies a variety of improvements to toroidal MHD generator design. Using a tightly sealed toroidal layout, with a polar operating fluid of a lower dielectric constant than dielectric constant of the coating lining the inside of the hollow, toroidal channel in which the operating fluid circulates.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates a overall view of an embodiment of the MHD generator.

FIG. 2 illustrates a lateral section of the same embodiment of the MHD generator shown in **FIG. 1**

DETAILED DESCRIPTION OF THE INVENTION

The advantages of this invention over the existing art include: efficiency upgrading, reliability and ecological safety growth as well as simplification of the MHD generator design.

The above said purposes are achieved as follows.

In this adaptation of the known MHD method for the production of electric energy by arranging the motion of a conducting medium in a predetermined direction along a closed circuit where the produced electric energy is collected by means of electromagnetic windings, a novel feature is that a polar liquid is issued as a conducting medium which is ionized at least at the stage of launching and the polar liquid is circulated by means of traveling magnetic field with the help of electromagnetic exciting windings, as this takes place, the motion of the medium is arranged in a hermetic channel internal walls of which have a dielectric constant higher than the polar liquid has.

The said liquid may be ionized by high-voltage discharges or with the help of a disc made of diamagnetic material rotating inside the channel with the said liquid.

The liquid motion may be stabilized with the help of a hermetic chamber filled with polar liquid, at that, the chamber has electromagnetic windings and is attached to the channel.

If water is used as said liquid, its previous activation may be carried out by adding heavy water (deuterium and tritium).

In the above-mentioned known device of the MHD-generator which contains a toroidal channel with the body made of non-magnetic material inside of which there is a dielectric

coating and electromagnetic system with windings, the novelty is that the channel is made hermetically and filled with polar liquid, and that the dielectric constant of the channel's surface is higher than the same of the said liquid.

Water which may contain heavy water (deuterium and tritium) may be used as said liquid.

The MHD-generator may contain a hermetic stabilization chamber which has conjunction with the channel placed outside it in the internal area of tore. As this takes place, the chamber may be made as a cylinder, the axis of which lies in the plane of the middle axis of the toroidal channel.

The MHD-generator may contain a liquid ionization device which may be made as electrodes placed inside the channel and attached to a periodic high-voltage source, or as a diamagnetic disc placed inside the channel and attached to a rotary actuator.

The electromagnetic system may contain power windings and exciting windings which may be placed inside the channel as opposed to outside the toroidal housing.

Ferroelectric material may be used as a coating for the channel walls.

One embodiment of such a MHD generator contains a hollow sealed toroidal body 1 constructed of metal ceramics the internal surface of which is covered with layer 2 of dielectric coating and a cavity is filled with distilled water 3 with added heavy water. In the channel of body 1 there are electrodes 4 made of hard-alloy material connected up to capacitor bank, as well as exciting windings 5 connected up to a power source. Inside the ring of body 1 there is assembled cylindrical stabilization chamber 6 made of metal ceramics being communication with the channel of body 1. The internal surface of chamber 6 is also covered with layer 7 of synergetic dielectric and the cavity is filled with distilled water 8 with added heavy water. Body 1 and chamber 6 have power windings 9 and 10 on the outside.

The MHD generator operates as follows: partially ionized water 3 with the addition of heavy water) is ionized additionally by high-voltage discharges from electrodes 4. A traveling magnetic field is created with the help of windings 6 which creates water motion 3 in one direction in the channel of body 1. Electromotive force develops in windings 9 at the expense of electromagnetic induction. As a result of water flow motion free electrons appear and additional energy releases at the expense of friction of water 3 on layer 2 and electrostatic breakdowns of cavitation-and-vacuum structures and the existing reaction of cold nuclear fusion. As this takes place, the quantity of electric energy produced on windings 9 is sometimes greater than the total input energy spent on ionization and acceleration of water by electrodes 4 and windings 5. At that, the proposed device and method do not contradict the energy conservation law because the

excess energy (in respect to input energy) releases from water 3 and internal layer 2 which should be replaced with time. Stabilization of liquid motion 3 is created at the expense of interaction of (e) discharges in it with discharges in chamber 6. In doing so, electric energy may be also collected from windings 10.